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10/656,731	09/04/2003	Yoshiaki Tanaka	10844-34US (203067D-1)	4770

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EXAMINER	
ROE, JESSEE RANDALL	

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1793	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/656,731	TANAKA, YOSHIAKI	
	Examiner	Art Unit	
	JESSEE ROE	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3-58* is/are pending in the application.

4a) Of the above claim(s) *11-14 and 23-50* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *3-10, 15-22 and 51-58* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

Claims 3-58 are pending wherein claims 3-4 and 51-58 are amended; claims 1-2 are canceled; and claims 11-14 and 23-50 are withdrawn from consideration.

Status of Previous Rejections

The previous rejection of claims 3-6 under 35 U.S.C. 103(a) as being unpatentable over JP 63-266034 or JP 63-266035 is withdrawn in view of the Applicant's amendments to the claims. The previous rejection of claims 3-6 under 35 U.S.C. 103(a) as being unpatentable over Parachuri et al. (EP 1,084,790 A1) in view of any one of JP 63-266034, JP 63-266035, or JP 63-270437 is withdrawn in view of the Applicant's amendments to the claims. The previous rejection of claims 7-10 and 51-58 under 35 U.S.C. 103(a) as being unpatentable over Parachuri et al. (EP 1,084,790 A1) in view of any one of JP 63-266034, JP 63-266035, or JP 63-270437, and further in view of Barry et al. (US 4,451,814), JP 11-306940A and Kanwanishi (US 5,982,268) is withdrawn in view of the Applicant's amendments to the claims. The previous rejection of claims 15-22 under 35 U.S.C. 103(a) as being unpatentable over JP 63-270437, and further in view of Barry et al. (US 4,451,814), JP 11-306940 A, Kawanishi (US 5,982,268) and Cole (US 4,251,718) is withdrawn in view of the Applicant's amendments to the claims. The previous rejection of claims 7-10 and 51-58 under 35 U.S.C. 103(a) as being unpatentable over Parachuri et al. (EP 1,0854,790 A1) in view of any one of JP 63-266034, JP 63-266035, or JP 63-270437, and further in view of Barry

et al. (US 4,451,814, JP 11-306940A and Kawanishi (US 5,982,268 is withdrawn in view of the Applicant's amendments to the claims. The previous rejection of claims 15-22 under 35 U.S.C. 103(a) as being unpatentable over Parachuri et al. (EP 1,084,790 A1) in view of any one JP 63-266034, JP 63-266035, or JP 63-270437, and further in view of Barry et al. (US 4,451,814), JP 11-306940A, Kawanishi (US 5,982,268) and Cole (US 4,251,718) is withdrawn in view of the Applicant's amendments to the claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3-6 and 51-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 63-266034 or JP 63-266035 in view of Barry et al. (US 4,451,814) and Kawanishi (US 5,982,268).

In regards to claims 3-4 and 51-58, JP '034 (abstract) teaches fuse compositions that overlap the compositions as claimed in the instant invention. JP '034 teaches a fuse element consisting of a small amount of copper and the balance being **one or more** kinds of metals among lead (Pb), bismuth (Bi), indium (In), cadmium (Cd), antimony (Sb), and tin (Sn). The fuse composition of JP '034 consisting of Cu, Sb, In, Sn, and Bi, does not contain Pb or Cd as required in the amended instant claim 1. The overlapping compositions of JP '034 compared to that of the instant invention are shown

in the table below.

Element	From Instant Claims	JP ('034)	Overlapping range
From Instant Claim 1		abstract	
In	15%-37%	0.01%-30%	15%-30%
Sn	5%-28%	0.01%-40%	5%-28%
Bi	balance	0.01%-50%	26.5%-50%
From Instant Claim 2		(abstract)	
Cu	0.1%-3.5%	0.01%-2%	0.1%-2%
Sb	0.1%-3.5%	0.01%-15%	0.1-3.5%

The ranges disclosed by JP '034 for indium (In), tin (Sn), bismuth (Bi), antimony (Sb) and copper (Cu) are within the ranges claimed in the instant invention.

The Examiner notes that the disclosed composition of the alloy fuse overlaps with the composition of the claimed invention. Therefore, a prima facie case of obviousness exists. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed alloy fuse composition from the disclosed ranges of JP '034 because JP '034 teaches the same utility (an alloy fuse composition) throughout the whole disclosed range.

Still regarding claims 3-4, JP '035 (abstract) teaches fuse compositions that overlap the compositions as claimed in the instant invention. JP '035 teaches a fuse element consisting of a specified amount of aluminum (Al) (0.01-10%), gold (Au) or silver (Ag), and the balance being **one or more** kinds of metals among lead (Pb), bismuth (Bi), indium (In), cadmium (Cd), antimony (Sb), and tin (Sn). The fuse composition of JP '035 consisting of Ag or Au, Sb, In, Sn, and Bi, does not contain Pb or Cd as required in the amended instant claim 1. The overlapping compositions of JP '035 compared to that of the instant invention are shown in the table below.

Element	From Instant Claims	JP ('035)	Overlapping range
From Instant Claim 1		abstract	
In	15%-37%	0.01%-30%	15%-30%
Sn	5%-28%	0.01%-40%	5%-28%
Bi	balance	0.01%-50%	28%-50%
From Instant Claim 2		(abstract)	
Ag or Au	0.1%-3.5%	0.01%-10%	0.1%-3.5%
Sb	0.1%-3.5%	0.01%-15%	0.1%-3.5%

The ranges disclosed by JP '035 for indium (In), tin (Sn), bismuth (Bi), silver (Ag) or gold (Au), and antimony (Sb) are within the ranges claimed in the instant invention.

The Examiner notes that the disclosed composition of the alloy fuse overlaps with the composition of the claimed invention. Therefore, a prima facie case of obviousness exists. See MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed alloy fuse composition from the disclosed ranges of JP '035 because JP '035 teaches the same utility (an alloy fuse composition) throughout the whole disclosed range.

Still regarding claims 3-4, JP '034 and JP '035 disclose fuse compositions as shown above. However, neither JP '034 nor JP '035 disclose applying the composition as a fuse element and a applying a flux thereto.

Barry et al. ('814) disclose selecting a metal alloy selected from the group consisting of indium, tin, lead, and bismuth (claim 8) and using the alloy in a thermal fuse that would have two leads that project from opposite ends of a housing of a sealed chamber (abstract). Barry et al. ('814) further disclose a cylindrical case (Figs. 1 and 2) leads that would have a disk-shape (Figs. 1-3), and connecting the fuse element to the ends of the disk-shape leads (col. 6, lines 1-18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the indium-tin-bismuth alloy fuse composition, as disclosed by JP '034 or JP '035, by connecting the indium-tin-bismuth alloy fuse composition between two lead wires (thereby forming a fuse element), as disclosed by Barry et al. ('814) because Barry et al. ('814) disclose making thermal fuse from alloys of indium, tin, and bismuth (claim 8 and abstract).

Kawanishi ('268) discloses a flux to exert an activation action to break the fuse after the melting of a fuse element in a thermal fuse due to an over-current (col. 3, lines 37-45).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply a flux, as disclosed by Kawanishi ('268), to the indium-tin-bismuth fuse element, as disclosed by JP '035 or JP '035 in view of Barry et al. ('814), in order to exert an activation action to break the fuse in the presence of an over-current, as disclosed by Kawanishi ('268) (col. 3, lines 37-45).

In regards to claims 5-6, the Examiner asserts that the fuse element would contain inevitable impurities.

Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 63-266034 or JP 63-266035 in view of Barry et al. (US 4,451,814) and Kawanishi (US 5,982,268) as applied to claims 3-6, and further in view of JP 11-306940.

In regards to claims 7-10, JP '034 or JP '035 in view of Barry et al. ('814) and Kawanishi ('268) disclose indium-tin-bismuth alloy fuse elements that would be connected lead conductors with a flux as shown above, but JP '034 or JP '035 in

view of Barry et al. ('814) and Kawanishi ('268) do not specify that the lead conductors would covered with a tin or silver film.

JP '940 discloses applying a tin or silver film to the surface of lead conductors in order to improve the bonding strength of the lead conductors (abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the indium-tin-bismuth alloy fuse elements that would be connected to lead conductors with flux of either of JP '034 or JP '035 in view of Barry et al. ('814) and Kawanishi ('268), by applying a tin or silver film to the surface of the lead conductors, as disclosed by JP '940, in order to improve the bonding strength of the lead conductors, as disclosed by JP '940 (abstract).

Claims 15-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 63-266034 or JP 63-266035 in view of Barry et al. (US 4,451,814) and Kawanishi (US 5,982,268) as applied to claims 3-6, and further in view of JP 11-306940 and Cole (US 4,251,718).

In regards to claims 15-22, JP '034 or JP '035 in view of Barry et al. ('814) and Kawanishi ('268), and further in view of JP '940 disclose indium-tin-bismuth alloy fuse elements that would be connected to lead conductors with a tin or silver film with flux, but JP '034 or JP '035 in view of Barry et al. ('814) and Kawanishi ('268), and further in view of JP '940 do not specify a heating element for fusing off a fuse element in the thermal fuse.

Cole ('718) discloses wherein a resistor thermally coupled to a thermal fuse to allow a predetermined amount of heat to cause the thermal fuse to blow (col. 4, lines 1-

22).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the thermal fuse as disclosed by JP '034 or JP '035 in view of Barry et al. ('814) and Kawanishi ('268), and further in view of JP '940, by thermally coupling a resistor to the thermal fuse, as disclosed by Cole ('718), in order to allow a predetermined amount of heat to cause the thermal fuse to blow, as disclosed by Cole ('718) (col. 4, lines 1-22).

Response to Arguments

Applicant's arguments filed 24 August 2007 have been fully considered but they are not persuasive.

First, the Applicant primarily argues that the fuse compositions disclosed by JP 63-266034 or JP 63-266035 are not alloy thermal fuses as claimed and none of the primary references teach or suggest an alloy thermal fuse which comprise a fuse element containing a specific composition and a flux applied to the fuse element. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Second, the Applicant primarily argues that a flux is unnecessary and undesirable in a current fuse and none of the primary references teach or suggest an alloy thermal fuse comprising a fuse element with a flux applied thereto as claimed. In response to these arguments, the prior art reference Kawanishi ('268) discloses adding

a flux to a current or thermal fuse (col. 3, lines 36-46). The fact that the applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Third, the Applicant primarily argues that none of the primary references teach or suggest all of the elements of independent claims 3 or 4 (i.e. an alloy type thermal fuse having a fuse element comprising a specific alloy composition and a flux applied to the alloy composition. The Applicant further argues that these elements are not taught by the secondary references cited by the Examiner. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In response to the argument that these elements are not taught by the secondary references, see rejections above.

Fourth, the Applicant primarily argues that flux is not needed in current fuses and would render current fuses unfit for their intended use and addition of the flux would decrease the effectiveness of fuse. In response to this arguments, the prior art reference Kawanishi ('268) discloses adding a flux to a current or thermal fuse (col. 3, lines 36-46). The fact that the applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for

patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571)272-5938. The examiner can normally be reached on Monday-Friday 7:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art Unit 1742

JR